Mission Operations Systems Office (MOSO)
Data Delivery and Operations Program Element

Forecasting And Scheduling Tool for Earth-based Resources (FASTER), Version 2.1

User's Guide

March 1, 1995

Jet Propulsion Laboratory
California Institute of Technology

D-12215

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User's Guide

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1. Introduction

1.1 Purpose and Scope

This document is a comprehensive guide to all the procedures needed to install and run the Forecasting and Scheduling Tool for Earth-based Resources (FASTER) tool suite. It is designed for use by both daily operators and occasional users. It provides detailed step-by-step procedures for using all the FASTER tools, in addition to procedures for maintaining the total FASTER hardware and software environment. This document assumes user familiarity with MS-DOS, MS-Windows, and MS-EXCEL.

The procedures in this document are listed in the order with which they would be used during nominal RAP operations.

1.2 What's New in FASTER Version 2.1

FASTER 2.1 is a minor upgrade to the FASTER tool suite, containing enhancements and closure of open failure reports both from Version 2.0 acceptance testing and subsequent operational use. For further information on the specific Failure Reports (FRs) and Change Requests (CRs) encompassed, please consult the FASTER 2.1 Work Implementation Plan. The following is a brief listing of the new features found in FASTER 2.1:

- Saving a schedule week to the database will also result in the week's being automatically released to the external users in the raw data format. {TEDIT}
- An "Auto-Save" feature will allow for periodic saving of the currently open week to the schedule database at user-defined time interval. {TEDIT}
- Schedule activities that fall outside the scope of the currently edited week will be saved to the appropriate week at the user's discretion. {TEDIT}
- The NSS viewperiod associated with each schedule activity will be displayted in the LINELIST output. {LINELIST}
- External users will be able to generate listing of released schedule weeks. {LINELIST}

C A "search & replace" capability will allow for changes to things like configuration codes to span multiple weeks. {SCHED}

C NSS viewperiods are now capable of being added to the viewperiod database. {VPUTIL}

C Date information is now displayed in the catalog output. {VPUTIL}

C After a forecasting run either the results or the infeasible requests worksheet will be immediately displayed. {FORECASTER}

1.3 FASTER Philosophy

FASTER is a set of MS-Windows-based applications, working together through shared data to provide forecasting, scheduling, and general data management capabilities for MOSO planning of ground resources.

FASTER is designed around Novell Netware networking and Microsoft Windows multi-tasking capabilities to allow the programs and data to be as widely available and usable as possible. FASTER is designed for centralized data and control (using a Novell file and database server) and decentralized processing.

Each FASTER program provides a single, coherent set of capabilities. Along with MS-Windows multi-tasking capabilities, this approach allows an operator to perform several functions simultaneously. New programs may be added as necessary to provide new required functions.

1.4 FASTER : The Tools

The tools can be divided into four groups:

- Scheduling Tools
- Resource Analysis
- Database Management Tools
- Miscellaneous Tools

Each tool is a stand alone product invoked without reference to any other tool.

Below is a capsule summary of each tool’s functionality:

1.4.1 Scheduling Tools

TEDIT	MS-Windows based schedule editor allowing the user to edit information in a schedule week.
LINELIST	MS-Windows based schedule lister that prints schedules to either to a printer or ASCII file with constraint violations optionally checked.
GAP REPORT	MS-Windows based program to identify DSN tracking gaps in user selected schedule week.
SCHEDREL	MS-Windows based Schedule release program. With this program the user controls which schedules are made available to the external project and DSN users.
RCOMM	DOS-based remote communications service program allowing external users to download released schedule files. This program requires a dedicated communications server, Btrieve for DOS, and the PC-ANYWHERE communications software.
WRCOMM	MS-Windows based remote communications service program allowing external users to download released schedule files. This program requires a Netware connection to the RAP server.

1.4.2 Resource Analysis Tools

VPVIEW	MS-Windows based program for viewing Viewperiod information both on screen and in print format using a Gantt style graph format.
FORECAST	MS-Windows/EXCEL based program for calculation of forecasting information. This program is run as a suite of Microsoft EXCEL macros.
OVERLAP	MS-Windows based program for calculating Viewperiod overlap information that is input into Microsoft EXCEL for plotting purposes.

USER SUMMARY	MS-Windows/EXCEL based program to display a summary of user requirements based on a user-selected year.
EVENTS	MS-Windows based major events database. Major events are used in conjunction with the Forecaster in locating potential periods of high activity

1.4.3 Database Management Tools

FSTRCTRL	MS-Windows based program for modifying FASTER database file locations and other system default settings which are stored in the workstation FASTER.INI file.
SCHED	MS-Windows based schedule database management utility for archiving, deleting, cataloguing, and loading schedule weeks to and from the master database file.
VPUTIL	MS-Windows based database management utility allowing the archiving, deleting, and cataloguing of Viewperiods in addition to the loading of new and updated Viewperiods into the database.

1.4.4 Miscellaneous Tools

DOYCAL	MS-Windows/EXCEL based program generating a twelve-month calendar with DSN week number and day of year based on a user-selected year.

1.5 Conventions

1.5.1 Interpreting User Guide Notations

(1) Names of keys match the labels shown on most keyboards and appear in capital letters enclosed in angle brackets. For examples, the shift key is <SHIFT>.

(2) A plus (+) sign used between two names of keys indicates you must press both keys one after the other. For example, <ALT+N> means to hold down the Alt key while pressing the N key.

(3) A comma (,) between two names of keys means that those keys must be pressed sequentially.

(4) Brackets [ ] enclose optional parameters for FASTER and DOS commands.

(5) The world choose is used for carrying out a menu or dialog box command.

- Click the OK button on the display with the left mouse button.
- Press the <ENTER> or Carriage Return key on the keyboard.
- Press the <SPACEBAR> on the keyboard. [1]

(All three keys have the same effect)

(7) Bold type indicates a button on the display to be "pressed" by pointing to it with the mouse cursor and then clicking the mouse button.

(8) Words in "quotes" indicate a titled dialog box.

(9) A numbered list (1,2,3...) (except for those in this section) indicates a procedure of two or more sequential steps.

(10) <ARROW KEYS> is the collective name for the <UP ARROW>, <DOWN ARROW>, <LEFT ARROW>, and <RIGHT ARROW> keys.

1.5.2 Using the Mouse

(1) Point means to position the point of the mouse pointer on something on the screen.

(2) Click means press and immediately release the left mouse button without moving the mouse.

[1] *Only* if the <**OK**> button is grayed i.e. inactive

(3) Double click means to click the left mouse button twice in rapid succession.

(4) Drag means to press the left mouse button and hold it down while you move the mouse; then release the button.

(5) Item Selection: To select a program item or cause an action to be performed, position the mouse cursor over the item and click the left mouse button[2].

(6) Scrolling: To scroll a window's contents one line at a time, click the left mouse button on the horizontal or vertical arrows at either ends of the scroll bars on the window's right hand side. Each mouse click will scroll the window's contents one line.

Multiple mouse clicks will move the screen contents multiple times.

To scroll a window's contents one page at a time, click the left mouse button between the scroll bars' up or down arrows and the thumb tack (the small square box on the scroll bar). Each mouse click will scroll the window's contents one page full.

To position the window's contents at a specific location, press the left mouse button on the thumb tack and drag it.

1.5.3 Editing Text

(1) To enter text, use the keyboard keys as is done in the DOS environment.

(2) You can use the arrow keys or the mouse to position where the next character will appear.

(3) Use the <BACKSPACE> and <DEL> keys to erase characters.

(4) Use the <ENTER> key to signal the end to keyboard input.

(5) You can delete data by "selecting" it and pressing the <DELETE> key.

[2] In FASTER, the right mouse button is not used.

1.6 Applicable Documents

1.6.1 JPL Documentation

This document is consistent with and responsive to the requirements and objectives of the following documents:

(1) M4 MOSO0477-01-00, FASTER 2.1 Work Implementation Plan, 9 August 1994, JPL D-12659

(2) M4 MOSO3006-01-01, FASTER Functional Requirements Document, 26 May 1993, JPL D-9962 Change 1

(3) M4 MOSO3101-03-00, FASTER Software Requirements Document, 1 January1995, JPL D-9963, Rev. B.

(4) MD MOSO8203-01-00, FASTER Configuration Management Procedures, 5 May 1994, JPL D-9931.

(5) M4 MOSO0842-01-00, FASTER Release Description Document Version 2.0, 13 October 1994, JPL D-10866.

(6) M6 MOSO5205-02-00, FASTER System Management Plan, 1 March 1995, JPL D-10464 Rev. A

(7) M4 MOSO3303-01-01, FASTER Raw Data File Software Interface Specification Change 1, 14 May 1993. JPL D-10484

1.6.2 Commercial Software Documentation

(1) MS-DOS 5.0/6.0 User’s Guide.

(2) Microsoft Windows 3.1 User’s Guide.

(3) Microsoft Excel 4.0 User’s Guide.

(4) Novell Netware Documentation.

(5) PC Anywhere User’s Guide.

(6) PROCOMM Plus User’s Guide.

2. Getting Started

2.1 Hardware and Software Requirements

2.1.1 Hardware

The following hardware is needed to run the FASTER software:

- **Server**

  - 80386 33-MHz processor with 387 math coprocessor
  - 16 Mb RAM
  - 600-Mb hard disk
  - 1 UPS
  - SCSI board/Python Digital audio tape drive system
  - Novell NE-2000 Ethernet board
  - Ethernet cable

- **Workstation**

  - 80386 33-MHz processor with 387 math coprocessor
  - 640 X 480, 16 color graphics; 800 X 600 recommended, 1024 X 768 ideal
  - 8 Mb RAM
  - 150-Mb hard disk
  - Ethernet cable
  - Novell NE-2000 Ethernet board

2.1.2 Software

The following software is needed to support the FASTER software:

- **Workstation**

  - MS-DOS Ver. 5.00 or later
  - MS-Windows Ver. 3.1 or later
  - Novell Netware Shell Ver. 3.26
  - Novell Btrieve Data Requester Ver. 5.1
  - PROCOMM PLUS
  - MS-EXCEL Ver. 4.0 or later

- **Server**

CC Novell Netware Ver. 3.11 or later
CC Novell Btrieve server Ver. 5.1

2.2 Installing the FASTER Software

Server setup must be performed before workstation setup; however, since workstation setup is more commonly performed, the workstation setup section is presented first.

2.2.1 Setting Up the Workstation

This procedure assumes DOS and Windows have already been installed.

See the respective Netware manuals for installing Netware.

- **Step 1: Set up network access for the workstation and user**.

Ensure that the workstation user has a proper account on the JPL-RAP file server where FASTER will reside and that the workstation is set up to properly attach or log in to that server. The AUTOEXEC.BAT file should include command lines that load the appropriate network drivers and log the user into the server. These can be either individual command lines to the AUTOEXEC.BAT or a separate batch file "CALL'd" from the AUTOEXEC.BAT file but physically located elsewhere on the workstation hard disk. For example:

```
LSL
NE2000
IPXODI
NETX
F:                  (assuming the line "LASTDRIVE=E" is in the CONFIG.SYS file)
LOGIN JPL-RAP/      (the user will be prompted for user name and password)
C:
BREQUEST /D:8192
```

- **Step 2: Create FASTER group and add icons for each FASTER program**

To create a FASTER program group in the Windows Program Manager do the following:

(1) From the MS-Windows Program Manager **File** pull-down menu, select New... .

(2) In the "New Program Object" dialog box, click the **Program Group** radio button, then click **OK**.

3) In the "Program Group Description" dialog box, enter the following information:

- Description **FASTER**
- Group File (enter nothing)

(4) Click **OK**.

Windows will display the newly created FASTER group window in the Program Manager's window.

(5) Follow the procedure in the Windows User's Guide (pp. 78-83) for adding programs to a program group. FASTER programs come with pre-built icons that will become visible when they are added to the FASTER group.

The FORECAST icon should contain the command line FORECAST.XLA[3] and the FASTER\EXCEL directory as the working directory.

For all other FASTER tools (i.e., TEDIT, LINELIST, VPVIEW, OVERLAP, FSTRCTRL, VPUTIL, SCHED, and SCHEDREL), the program name should be entered as the command line and the full path of the FASTER EXE directory should be entered in the working

[3] Not **.EXE**. The .XLA is an EXCEL macro that will, among other things, call the required .EXE file when needed.

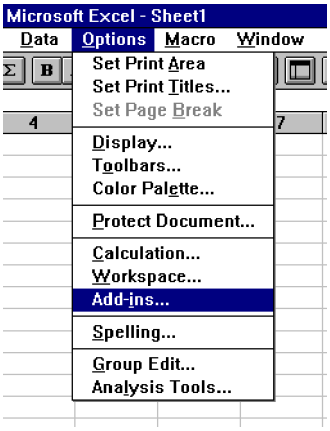
directory. In the case of EVENTS, after EVENTS.EXE, add a space and the letter 'E' (for "edit"). One way of limiting easy access to FASTER tools is through the icons: simply do not add icons for unwanted programs. Another way to do this is to click the **Browse** button and let the Windows Program Manager locate the file for you.

- **Step 3: Install Excel 4.0**

Follow the EXCEL Setup instructions with Excel 4.0 to perform a full installation. For FORECAST to work properly, the File Functions add-ins must be properly installed in EXCEL.

If you are doing a first time EXCEL installation, the file functions add-in will not be present. Unless the file **filefns.xla** is loaded, FORECASTER will not run. To add it to EXCEL, do the following:

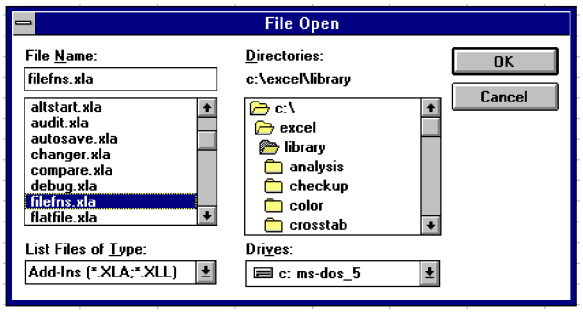
(1) From the EXCEL **Options** pull-down menu, select Add-ins... .



The "Add-In Manager" dialog box appears.

(2) If **File Functions** is not listed in the **Add-Ins Installed** list box, click on the **Add**... button.

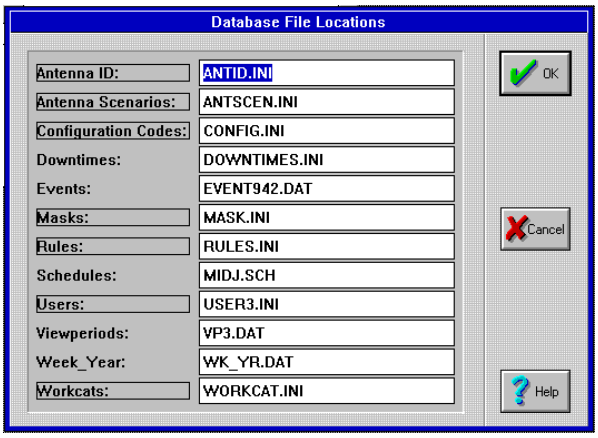
The "File Open" dialog box appears.

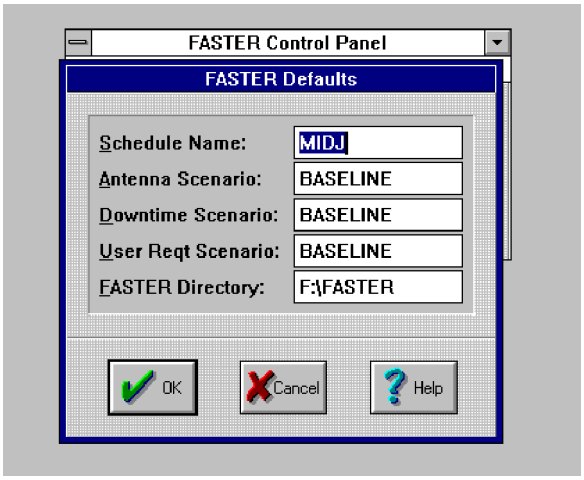


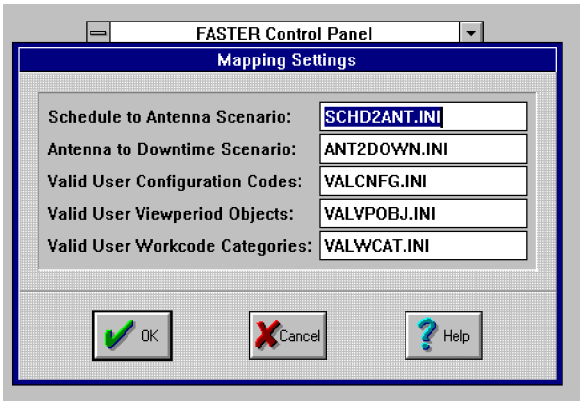
(3) Click on **Filefns.xla** in the files list and click **OK**. EXCEL adds the file **filefns.xla** to its master list.

- **Step 4: Set up FASTER.INI**

Copy the FASTER.INI file from the Configuration-Management-provided FASTER installation diskette to the WINDOWS directory of each workstation. The file should be edited, and the entry for Faster Directory should be changed to reflect the workstation's mapping of the root FASTER directory (for example, F:\FASTER). The following three figures show the names to be entered in the dialog boxes accessible from the FASTER Control Panel.


Database File Locations
Antenna ID:
ANTID.INI
Antenna Scenarios:
ANTSCEN.INI
Configuration Codes:
CONFIG.INI
Downtimes:
DOWNTIMES.INI
Events:
EVENT942.DAT
Masks:
MASK.INI
Rules:
RULES.INI
Schedules:
MIDJ.SCH
Users:
USER3.INI
Viewperiods:
VP3.DAT
Week_Year:
WK_YR.DAT
Workcats:
WORKCAT.INI
OK
Cancel
Help


FASTER Control Panel
FASTER Defaults
Schedule Name:
MIDJ
Antenna Scenario:
BASELINE
Downtime Scenario:
BASELINE
User Reqt Scenario:
BASELINE
FASTER Directory:
F:\FASTER
OK
Cancel
Help


FASTER Control Panel
Mapping Settings
Schedule to Antenna Scenario:
SCHD2ANT.INI
Antenna to Downtime Scenario:
ANT2DOWN.INI
Valid User Configuration Codes:
VALCNFG.INI
Valid User Viewperiod Objects:
VALVPOBJ.INI
Valid User Workcode Categories:
VALWCAT.INI
OK
Cancel
Help

- **Step 5: Set up workstation Btrieve**

Each workstation must load the Btrieve workstation requester (BREQUEST.EXE). This Terminate-and-Stay-Resident (TSR) program should be invoked from each workstation's AUTOEXEC.BAT file after the user has successfully logged into the server (since the file should be run from the SYS:PUBLIC directory of the server). The line in the AUTOEXEC.BAT file should be

BREQUEST/D:8192

In addition, each workstation must have access to several MS-Windows Dynamic Link Libraries (DLLs) in order to function properly: **WBTRCALL**, **NWNETAPI**, and **BWCC**. These DLLs are found in the SYS:PUBLIC directory of the server. No copies of WBTRCALL.DLL or WBTRLOCL.DLL should reside on any workstations. If they exist, delete or rename them prior to running FASTER. With ver. 2.0 a new INI file NOVDB.INI must be added to the \WINDOWS subdirectory.

The WIN.INI file located in the workstation's WINDOWS directory should be edited to include the following lines (italicized in this example):

```
[Btrieve]
options=/m:64 /p:4096 /b:16 /f:20 /l:20 /n:12

[brequestDPMI]
datalength=8192
tasks=10
local=no
chkparms=no
```

These parameters are needed for proper operation of the BREQUEST.EXE program. In order for the EVENTS tool to operate properly, the "local" parameter must be set to **no**.

The file NOVDB.INI should be added to the workstation \WINDOWS subdirectory. This file is used by the BREQUEST software to configure itself

- **Step 6: Test each program to ensure proper operation.**

Run each program according to the relevant sections found in the remainder of this document, and check that no error messages are generated. Most of the FASTER Windows programs have on-line help accessible through the <**F1**> key or the **Help** menu entry.

2.2.2 Setting Up the Server

This procedure assumes Novell Netware Ver. 3.11 has already been installed on the file server.

- **Step 1: Create directories and copy files.**

All the common files required for FASTER are to be kept in a set of subdirectories under one directory on the FASTER file server. The full path of this "root" FASTER directory must be in the FASTER.INI file of each workstation (e.g., F:\FASTER). The required subdirectory names and their contents are:

EXE	All executable programs.
DATA	All Btrieve database files and all shared program information files (.INI) and the following required subdirectories:
~~**AMMOS**~~	~~All AMMOS editor schedules.~~
REMOTE	All data files used by the RCOMM program.
DSN	All schedule data files for release to DSN.
EXCEL	All Excel templates and macros to be used by FASTER.
HELP	All Windows format help files for FASTER.

- **Step 2: Set up Btrieve server**

In order to make the Btrieve server automatically start up when the file server boots up, place the command **BSTART** in the file server's AUTOEXEC.NCF file (using the system options in the INSTALL NLM). There are several parameters that must be set in order for the Btrieve server to operate properly; these parameters are set using the BSETUP NLM. A summary of the parameters and their use follows:

# of open files:	**20**	This parameter must be set higher than the total number of Btrieve database files that will reside

		and be accessed on the file server (right now only two files).
# of handles:	**60**	This parameter must be set higher than the total number of instances of programs that will access Btrieve data. For example, if two users each have two instances (copies) of the text editor running, that is a total of 4 instances and hence each instance will use a handle during the duration of its run.
# of locks:	**2048**	This number must be set higher than the total number of locks that will be used simultaneously. Presently, locks are used only by the schedule editor: one per week being edited.
# of transactions:	**0**	This parameter is used only if files are created as transactional.
# of files per transaction:	**12**	This parameter is used only if files are created as transactional.
Largest compressed rec size	**0**	This parameter is used only if compressed records are used. No compressed records are currently used in FASTER.
Largest records size	**8192**	
Largest page size	**4096**	
Number of sessions	**15**	
Create files as transactional		**NO**
Logging of selected files	**NO**	

Below is a listing of the JPL-RAP's current BTRIEVE configuration:

```
+-------------------------------------------------------------------------+
| NetWare Btrieve Setup  V5.15                  NetWare 386 Loadable Module  |
```

```
+-------------------------------------------------------------------------------+
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
+-------------------------------------------------------------------------------+
|                         Current Btrieve Configuration                         |
|-------------------------------------------------------------------------------|
|             Number of open files:   20                                        |
|                Number of handles:   60                                        |
|                  Number of locks: 2048                                        |
|           Number of transactions:    0                                        |
| Number of files per transaction:   12                                        |
|  Largest compressed record size:    0                                        |
|              Largest record size: 8192                                        |
|                Largest page size: 4096                                        |
|               Number of sessions:   15                                        |
|   Create files as transactional:   No                                        |
|      Logging of selected files:    No                                        |
+-------------------------------------------------------------------------------+
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
```

- **Step 3: Create user groups and accounts**

Accounts must be set up so that access to files is given only as needed. User accounts (and hence access) should be categorized into groups (configured according to the discretion of RAP) so that each user account does not have to be tailor made.